



Armed Forces Health Surveillance Center

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Johns Hopkins APL and Armed Forces Health Surveillance Center Release Open Source Electronic Disease Surveillance Software

Tools now available for customization, analysis and widespread distribution

The Johns Hopkins University Applied Physics Laboratory (APL) and the Armed Forces Health Surveillance Center (AFHSC) have released the *Suite for Automated Global Electronic bioSurveillance* (SAGES), a collection of flexible, open-source software products developed for electronic disease surveillance in all settings.

Public health officials around the world, especially those with limited capabilities or resources to meet World Health Organization International Health Regulations requirements for outbreak surveillance and reporting, can use a SAGES system that is both effective and secure (<http://www.jhuapl.edu/sages/>). Through this initial open source code release, users can download and customize the various software to fit their needs, as well as contribute to the continued development of SAGES.

Developed by APL in collaboration with the Global Emerging Infections Surveillance and Response System (GEIS), a division of AFHSC, the free software suite is designed to collect, analyze, visualize and share information within a national disease surveillance system. Individual SAGES tools may be used to complement existing disease surveillance systems, or used all together to create an end-to-end disease surveillance capability.

“Having the ability to quickly detect disease cases is critical for global health security,” says U.S. Public Health Service Lt. Cmdr. Christopher Perdue, the GEIS project manager. SAGES analysis and



visualization tools are modeled after the successful U.S. civilian and military surveillance systems known as the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE), developed more than a decade ago by APL and the U.S. Department of Defense.

SAGES-based systems can use any combination of radios, simple cell phones, Android-based smartphones, tablets, and computers to collect data. In Central and South America, Southeast Asia, and Africa, public health collaborators have used SAGES tools to develop sustainable, customized electronic disease surveillance systems and provide vital end-user feedback to APL during development. “Resource-limited countries have traditionally lagged behind the information technology revolution in public health because of the challenges they face with IT infrastructure, resources and cost of proprietary software,” says Sheri Lewis, APL’s Global Disease Surveillance program manager. “SAGES is designed to fit the needs of the local environment and uses the existing infrastructure and technology available, requiring minimal investment.”

Those who modify the computer code may share their innovations with other users. APL and GEIS will continue to monitor the SAGES website and update the downloadable version as new components are tested and validated. “SAGES will promote fast and effective public health responses, and we want users to be involved in its ongoing development,” says Perdue. “We have designed it to be highly adaptable and easily sustainable, while allowing each national authority to maintain control over its own data systems.”

The Applied Physics Laboratory, a not-for-profit division of The Johns Hopkins University, meets critical national challenges through the innovative application of science and technology. For more information, visit www.jhuapl.edu.

The AFHSC provides timely, relevant, actionable and comprehensive health surveillance information in order to promote, maintain and enhance the health of military and military-associated populations. For more information, visit www.afhsc.mil.